

ABSTRACT

A material removal apparatus employing a showerhead with non-planar topography is provided. The showerhead surface includes a plurality of fluid zones to apply a fluid pressure to a backside of a polishing pad while a front side of the polishing pad polishes a substrate. The varying topography of the showerhead surface and the resulting variable gap between a backside of a polishing pad and the non-planar surface of showerhead provide a well-defined fluid distribution and pressure profile for each zone. Such well-defined fluid distribution and pressure profiles, in turn, establish well-defined material removal rates on the substrate as the polishing pad polishes the substrate.